

## A Supplement to the Revision of the Ant Genus *Basiceros* (Hymenoptera: Formicidae)

WILLIAM L. BROWN, JR.

DEPARTMENT OF ENTOMOLOGY, CORNELL UNIVERSITY, ITHACA, NEW YORK 14850

RECEIVED FOR PUBLICATION JANUARY 7, 1974

**Abstract:** The genus *Basiceros* is expanded to include *Aspididris* due to the finding of a new species, *B. conjugans* (Amazonian Ecuador and Colombia), which connects them. *Basiceros* is redefined and the male caste formally described, and keys are provided for the known forms of both sexes. The known distribution of *B. singularis* is extended to northern Mato Grosso and of *B. discigera* to Espirito Santo State, Brazil, and to subandean Colombia. *B. singularis* is confirmed as a termite predator.

### INTRODUCTION

The genera *Basiceros* and *Aspididris* were treated by Brown and Kempf (1960: 171–181) as part of a world revision of the myrmicine tribe Basicerotini. At that time, we said of the status of *Aspididris* (op. cit., p. 179):

This genus, known from workers and females, includes two neotropical species with the basic characters of *Basiceros*, but in which the posterior half of the head has been transformed into a disc-like structure, with the vertex convex, but the lateral and posterior occipital borders drawn out into a sharp, upturned, saucer-like margin that is ornamented with a row of clavate hairs. In *A. militaris*, this margin is continuous around the back of the head, from near one compound eye to the other, while in *A. discigera*, it is slightly interrupted posteromedially. . . . *A. discigera* has been placed in *Basiceros* by previous authors, and it is clearly transitional in head shape between a species like *B. convexiceps* and the extreme *Aspididris militaris*. Thus, while the generic split seems almost academic, the distinction can still be drawn rather clearly on a practical basis, and there seems to be no good reason to synonymize *Aspididris* unless further intergradient species are found.

The Wheelers have shown that the larva of *A. militaris* is very similar to that of *Basiceros*. The two *Aspididris* species are known from Trinidad and southeastern Brazil, and both are uncommon. We have no biological data on them beyond the fact that they are collected in moist forested areas.

### DISCUSSION

The "further intergradient species" has now been found, and it is described below as *Basiceros conjugans*. This new species so clearly and completely links *Basiceros* and *Aspididris* that there is no longer any excuse for recognizing the latter as a genus apart, and the formal generic synonymy is recorded here. The genus *Creightonidris*, with the sole species *C. scambognatha*, is closely related to *Basiceros* but is separated on the basis of its extremely aberrant mandibles.

The present paper, offered as a supplement to the revision of 1960, also

describes the adult male caste of *Basiceros* in modern terms and presents some new information on the distribution and biology of the species. A new key to the *Basiceros* species is appended.

This article is dedicated to the memory of Dr. William S. Creighton, who in 1950 breathed new life and reason into ant taxonomy with "The Ants of North America."

I should like to acknowledge the help of Dr. Henry Hermann, University of Georgia, and Drs. Stuart and Jarmila Peck, Carleton University, Ottawa, Canada, for furnishing material critical for this study. My own collecting and other aspects of the research contributing toward this paper were supported in large part by U.S. National Science Foundation, Grants GB-2175 and GB-31662X.

#### BASICEROS

*Basiceros* Schulz, 1906, Spolia Hymenopt., p. 156, *nom. pro Ceratobasis* F. Smith. Type: *Ceratobasis singularis* = *Meranoplus singularis* F. Smith.

*Basiceros*: Brown and Kempf, 1960: 171; see for complete synonymy; nomenclature and history on pp. 168-169.

*Aspididris* Weber, 1950: 3. Type: *Aspididris militaris* Weber, by original designation. New synonym.

*Aspididris*: Brown and Kempf, 1960: 179.

The diagnosis of the genus has to be modified in part to include the characters of the two *Aspididris* species.

*Worker*. Head trapezoidal, oblong or disc-like, the posterior and lateral borders separate and either rounded or crested, or else combined into a curving, continuous or near-continuous crest around the back of the cranium. Mandibles sub-parallel, triangular, with straight, opposable, multidenticulate masticatory borders; blade narrowed before insertion, the resulting peduncle either partly exposed or entirely hidden beneath clypeus, so that an interspace between basal mandibular and anterior clypeal borders is present or absent in varying degrees.

Propodeal teeth lamelliform, more or less acute.

Malpighian tubules 5.

*Queen*: Like worker, but more robust and with developed pterothorax bearing wings in virgins; ocelli present.

*Male*. (Generic description based on *B. discigera*, *B. conjugans*, and *B. singularis*): Size a little smaller than the conspecific queens and workers, and more slender. Head broadest across the large, bulging eyes (which are situated at or a little in front of midlength) rather suddenly narrowed in front of eyes and tapering moderately anteriorly; median vertex and ocelli prominent. Clypeus broad, its postero-median lobe convex and truncate or rounded, extending about to level of frontal lobes; its anterolateral lobes concave, free margin with a thin, sharp, yellowish edge, transverse or concave in front and rounded-divergent on sides. Frontal area variably distinct, semicircular or transverse, more or less impressed; rugose or carinate in the middle, and more or less distinctly delimited behind by an arched carina or rugulae that tend to connect the two frontal lobes. Frontal lobes prominent and projecting forward, laterad and dorsad, their free margins rounded sharply in front and broadly laterad, antennal insertions on their ventral faces. Lateral bases of lobes continued laterad as sharply

raised arching carinae running nearly to the eye on each side, then curving forward to bound deeply excavated, subreniform antennal scrobes, which are bounded in front by the cariniform posterior borders of the lateral wings of the clypeus. (Similar arrangements are found in many Attini, but in these the scrobes are usually not so deep or so sharply bounded.) Posterior vertex bordered along the cervical limit by a lamelliform margin bearing short longitudinal costulae; space between this and posterior ocelli either steep or gradual, depending on whether the head is much drawn out behind or not. A continuous or nearly continuous, sharp but irregular, ventrolateral carina extends from posterior corner of head to mandibular insertions, bordering a subrectangular piece of the cheek extending between eye and mandibular insertion, and bounded mesad by the carinate outer scrobe margin.

Mandibles subtriangular, with curved outer borders converging rapidly in the apical half, meeting along the masticatory borders, and the sharp apices crossing; gently downcurved and the dorsal faces gently convex. Masticatory borders serially 8-12-dentate. Mandibles petiolate or not, with or without anteclypeal space, and form of labrum in general as in conspecific workers.

Antennae long and slender, 13-merous. Scape very short, only about twice as broad as long, its base oblique, with the more acutely rounded angle on the outside, and the obtuse angle inside (mesal), tapered toward the truncate apex; a little thicker than the remaining segments. First funicular segment (pedicel) only about half as long as scape; succeeding segments all much longer than broad; apical segment longest, third antennal (funiculus II, counting from base) also very long.

Trunk robust; prescutum with a more or less distinct anteromedian carina; notauli deep and complete, the arms of the Y forming rows of deep punctures separated by the intercalated costulae. Parapsidal furrows in the form of fine shining lines; parapsides more or less impressed behind, but each with a sharp, raised posterolateral margin. Prescutellum separated from scutellum by an impression or transverse row of punctures, or else the middle part impressed and not distinct from scutellum; lateral wings of prescutellum with a laterally marginate, posteriorly pointed process or blunt hook on each side. Scutellum narrower than prescutellum, forming an elongate near-semicircle as seen from above, free borders marginate, but posteromedian portion concave; posterior aspect broadly Y- or U-shaped. Metanotum narrow, with a blunt median tumosity. Propodeum with dorsal face flat, rectangular, steeply sloping toward the rear, separated from rectangular declivitous face by a transverse carina. As seen from the side dorsal and declivitous faces of propodeum meeting at an obtuse angle; declivity marginate on each side.

Petiole clavate, with anterior peduncle and long, low rounded node, usually bent slightly downward near base of posterior peduncle; spiracles papillose, prominent. Postpetiole broader than long and a little broader behind than in front and broader than petiole; rounded above, sternum shallow; attached its full width behind to gaster, which is slightly concave in front to receive it. Gaster with first segment occupying most (70 percent or more) of its length; four visible apical segments subequal in length. Genital capsule slender; parameres slightly broadened, bluntly rounded and curved mesad at apices, but tapered to a blunt end as seen from the side; volsellae sock-shaped, as usual in Myrmicinae; pygidium and subgenital segment unremarkable, with moderately narrowly rounded apical margins.

Legs slender, tibiae of middle and hind pairs without apical spurs; tarsal claws slender and simple. Wings brownish, with opalescent bluish reflections (both sexes) and dense brown microtrichiation. Forewing veined as in queen of *Creightonidris* (Brown and Kempf, 1960: 173, fig. 8) except that m-cu is usually present as a spur from M, or as a complete crossvein. Hind wing with only two longitudinal veins issuing from the median cell (apical abscissae of R and Cu), with the tip of Sc branching off from fused Sc + R (Rf1 lacking) as in the

*Tranopelta* male (Kusnezov, 1962: 371, fig. 23). Anal loop (A + cu-a) short, without a spur of A, but with a break or weak place at a longitudinal fold line. Hamuli 5-9, submedian.

Sculpture very finely and densely punctulate, opaque or nearly so, including legs, mandibles and antennae. Vertex with overlying loose rugulae, especially behind compound eyes and in and around ocellar triangle; loose rugulation also on trunk, especially posterior half of mesonotum and sides of propodeum. In some species, varying parts of mesopleura smooth and shining, or rugulose.

Pilosity of fine tapered hairs, golden brown in color, mostly erect or suberect on body (some also appressed on gaster and clypeus in some species); mandibles, antennae and legs with hairs becoming shorter, more abundant and decumbent passing from base toward apices of these appendages. Mesal face of antennal scape with two or more long fine hairs and some shorter ones.

Color black; legs and antennae brown.

Contains six species as known at present: *conjugans* n. sp., *convexiceps*, *discigera*, *manni*, *militaris* and *singularis*. *Basiceros militaris* is a **new combination**.

#### DISTRIBUTION AND BIOLOGY

*Basiceros* has been found only in wet tropical and subtropical forests of Central and South America and Trinidad at low and moderate altitudes. All of the colonies for which data are available have been found in rotten logs, or at least in pieces of rotting wood of fairly substantial size. The adults usually move very slowly, and they feign death for long periods when disturbed, rivaling the attine *Apterostigma* in their ability to escape detection by this means in the forest gloom.

Weber (1950: 6) noted that he had found a worker of *B. singularis* near midday carrying a dead termite in Guyana, and I found headless termites in a nest of this species in Mato Grosso (see below under *B. singularis*). Food of the other species is unknown, but they are almost certainly predatory, perhaps on termites, judging by the hardened incrustations that many workers bear.

#### *Basiceros conjugans*, n. sp.

*Holotype worker*. TL 5.8, HL 1.24, HW 1.05 (CI 85), ML 0.43, greatest diameter of eye 0.13, scape L 0.82, WL 1.51 mm.

*Paratype worker from type locality*. TL 5.9, HL 1.29, HW 1.09 (CI 84), ML 0.42, greatest diameter of eye 0.14, scape L 0.84, WL 1.56 mm.

*Paratype workers (two) from near Leticia, Colombia*. TL 6.2, 6.1; HL 1.32, 1.33; HW 1.14, 1.12 (CI 86, 84); ML 0.44, 0.45; greatest diameter of eye 0.14, 0.16; scape L 0.85, 0.87, WL 1.63, 1.63 mm.

Form of head and body well shown by Figs. 1 and 2. Sides of head bordered by a distinct raised margin that continues around the posterior corners and across the back of the head as a less distinct margin with a shallow dip in the middle. Cephalic disc shallowly concave inside the lateral margins, convex in the middle, but the convexity itself with a shallow median impression running back from about the level of the eyes. Clypeus gently convex in both directions, with a feebly concave free margin. Mandibles with concave external borders in full-face view, eleven strong teeth on each, triangular except for the basalmost tooth,



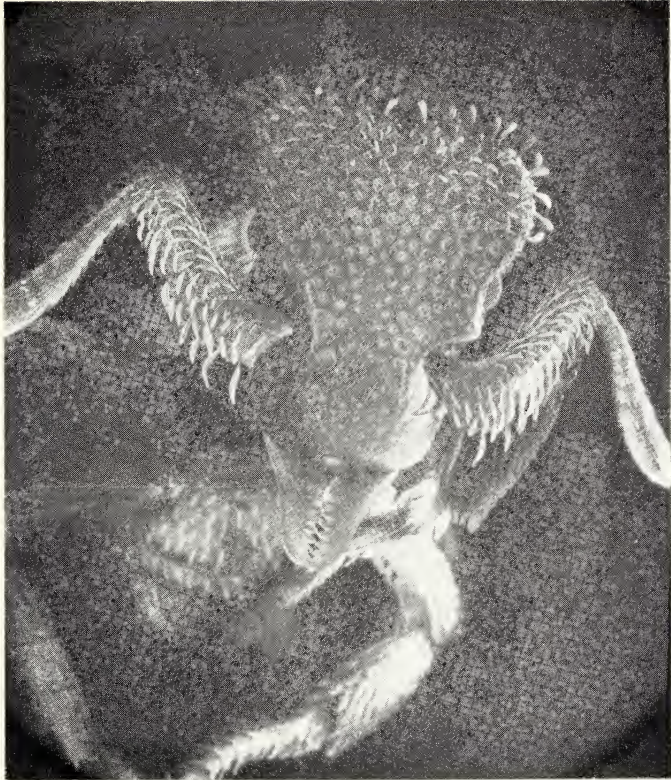
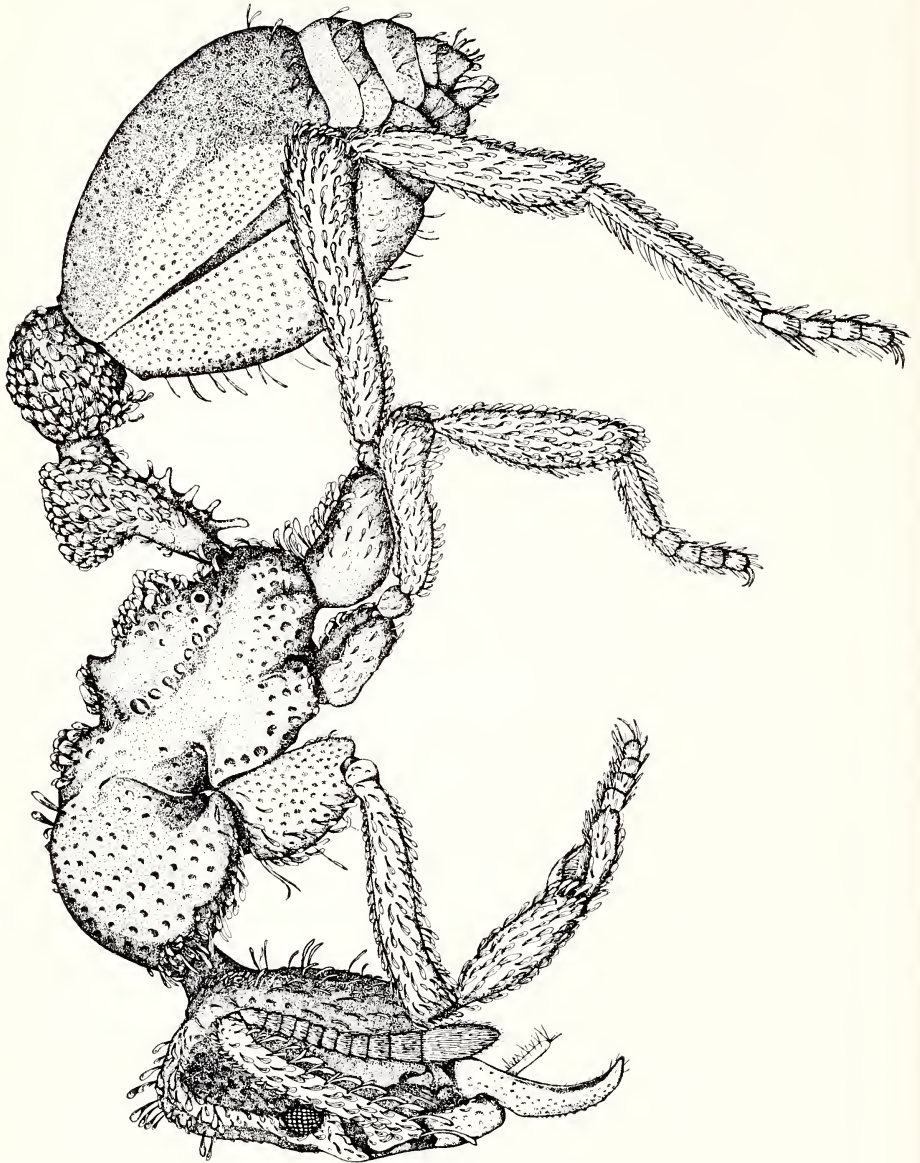


FIG. 1. *Basiceros conjugans*, new species. Head of paratype worker in slightly oblique face view; scanning electron micrograph,  $\times 40$ .

which is broad and rounded. Mandibular peduncles very short, mostly hidden under clypeus, leaving a short space between clypeal margin and basal borders. Extensor margin of scape with a broadly rounded, translucent, crenulate lobe around basal angle. Labrum elongate, tapered cuneiform, terminating in paired acute contiguous lobes separated by a narrow cleft. Palpi each consisting of two recognizable segments, which, however, are solidly fused in both maxillary and labial palpi to make one long crooked unit of each maxillary palpus, and one long, curved, clavate unit of each labial palpus. Cervical border of head with a strong raised margin.

Promesonotum forming a subglobular mass tapering sharply behind to the metanotum-propodeum, which is only a little more than half as wide seen from above. Promesonotal suture very faintly indicated above; metanotal groove broad and deeply impressed, longitudinally costate, succeeded posteriorly by a sloping, shelf-like propodeal dorsum that has a sharply downsloping declivitous face continuing into the final declivity of the propodeum. The declivity is bounded by carinae above and on each side; the transverse upper carina connects a pair of acute triangular teeth, hidden from side view by thick squamiform hairs. Bullae of metapleural glands prominent, projecting.

Petiolar node with a distinct anterior peduncle having a longitudinal carina on each side of dorsal surface; node distinct, with steep anterior face, mesally emerginate anterodorsal



border and posteriorly sloping rounded dorsum, the latter obscured by squamiform hairs, but its disc (without posterior peduncle) longer than broad. Subpetiolar processes 5 (4-6 in paratypes, sometimes adjacent processes partly fused). Postpetiole rounded in both directions, nearly twice as broad as petiole (pilosity excluded) and slightly broader than long, with a light-colored translucent anterior margin; attached behind its full width to concave anterior part of gaster as seen from above. Gaster with just the barest suggestion of a broad median longitudinal sulcus, visible only in certain lights. Sting retracted in holotype, but in a Colombian paratype worker, it is extended and has a shaft nearly 0.6 mm long.

Integument (where free of secretion and dense pilosity) prevailing smooth and shining, with coarse punctures, becoming smaller and spaced out on clypeus, and still smaller on mandibles. Punctures large and contiguous or subcontiguous in those areas bearing the dense heavy pilosity: posterior vertex, mesonotum, antero-dorsal shelf of propodeum, lateral edges of propodeal coxae, and both nodes of the waist. Propodeal declivity punctate-rugose, smoother ventrad. Pleural plates of meso- and metathorax and propodeum nearly free of punctures except along edges and sutural lines. Gastric segment I densely sown with closely spaced but separate medium punctures, less crowded along lateral curves of tergum; interspaces smooth and shining. Normally exposed tergal surfaces of terminal segments (abdominal V, VI, VII) finely and densely punctulate, opaque, but margins of these segments smooth and shining. Antennal scapes and legs smooth or with very fine superficial roughening, and coarse punctures for the hairs; in general shining; funiculi and distal halves of tarsi finely and densely punctulate, opaque to subopaque.

The shapes and location of the various kinds of pilosity are well shown in Figs. 1 and 2. The thicker squamiform and clavate hairs have a complicated microstructure. Under high magnification, the surfaces of these hairs appear fluffy, with ribs of free fibers running longitudinally, represented sometimes as fine lines in Fig. 2. A pair of erect clavate hairs on the vertex is not so easily distinguished in the figures, since they are close to the posterior borders of similar hairs on the vertex, but this pair straddles the ocellar triangle in the queen and corresponds to a similar pair in *B. discigera* and *B. militaris*. The pilosity is off-white, contrasting with the deep brownish-red (approaching mahogany) of the integument; appendages medium brownish-red.

*Queen (alate)*, one of eight alates and dealates from type nest series. TL 6.3, HL 1.32, HW 1.09 (CI 83), ML 0.46, greatest diameter of compound eye 0.24, scape L 0.86, WL 1.68, forewing L 4.9 mm.

*Male*, one of three from type nest series. TL 4.9, HL 0.92, HW across eyes 0.88 (CI 96), HW behind compound eyes 0.76, ML 0.25, greatest diameter of eye 0.30, scape L 0.14, WL 1.46, forewing L 3.8 mm.

Head of the short type, not produced behind, and with a narrow flange on cervical border. Rugulae behind eye shorter and weaker than in *B. discigera*. Most of mesanepisternum and upper middle part of mesokatepisternum smooth and shining. Petiole claviform, with node indistinctly set off from anterior peduncle; front of node bordered by a dorsolateral ruga on each side; subpetiolar processes: 1 large anterior tooth, plus 1-4 smaller teeth or lamellae, very inconstant.

←

FIG. 2. *Basicros conjugans*, new species. Lateral view of holotype worker. Drawing by Susan Poulakis,  $\times 40$ .



Holotype and a few other workers, queens and males were taken together at Limoncocha, Ecuador, by Dr. Henry R. Hermann, Sept. through Nov. 1964; a separate winged queen was taken at the same locality by Dr. Hermann. The paratype series also includes two workers taken in a rain forest leaf litter berlesate 7 km north of Leticia, Colombia, by S. and J. Peck (B-230) in February 1972.

This species is intermediate between *Aspididris discigera* and *Basiceros manni*, the latter representing the "typical" members of its genus. *B. conjugans* has partially developed ridges framing the posterior vertex in a manner intermediate between *discigera* and *manni*, and the erect clavate hairs on the back of the head are concentrated along the posterior edge in an intermediate kind of pattern. The exact shape of the head, the distribution of the peculiar broadened hairs on the trunk, and particularly their thick clustering on the petiole and postpetiole are sufficient characters to separate *B. conjugans* from all the other species.

#### *Basiceros discigera*

This species is widespread in southeastern Brazil, and I can extend the range northward into Espirito Santo State: Reserva Nova Lombardia, 4 km north of Santa Teresa, 900 m, 24 Feb. 1967 (W. L. Brown, Jr.). The nest was in a small fragment of a rotten log on the floor of wet upland forest, and contained two winged males.

A much greater and more surprising extension of the range is provided by a record from the eastern slope of the Andes in Colombia: Quebrada Susamuko, 23 km NW of Villavicencio, Dept. Meta, 1000 m, two workers in leaf litter berlesate (B-234), S. and J. Peck leg. The male is characterized in the key at the end of the paper.

#### *Basiceros manni*

I took a number of workers of this species in a large fragment of a rotten log found in the middle of a rain forest trail west of the bridge at Rio Toro Amarillo, near Guapiles, Costa Rica. The log fragment contained also workers of *Proceratium goliath*. The record represents only a northern "fill-in" of the range on the Atlantic Plain of Costa Rica; the species is known from Honduras and probably occurs through the forested lowlands of Nicaragua.

#### *Basiceros singularis*

In addition to the records of this species from the Guianas, Trinidad and Amazonas, Brazil, I collected it in the forest at the Fazenda Junqueira Vilela, Mun. Diamantino, northern Mato Grosso State, Brazil, on July 17, 1973. The nest was in a thoroughly rotten log in deep shade, and the headless bodies of three termites were found with the workers, winged queens and males in what appeared to be rude chambers. The adults simulate death for long periods when



disturbed and are exceedingly hard to distinguish by eye. Many are heavily encrusted with a light brownish or whitish material, apparently a hardened secretion. I take it that the material represents the hardened defensive allomones of prey termite species (nasutes?), although it is not altogether impossible that the secretion is produced by the ants themselves. Callow and near-callow workers and winged forms of both sexes in the nest lack the incrustation.

Some workers confined in a glass-topped plaster nest avoided or showed no apparent interest in live larvae of *Tribolium* and workers of *Zootermopsis* termites, though the latter are much larger than the ants and the termites found as apparent prey in the original nest. The ants did feed on crushed housefly pupae, and two eggs that must have been laid by workers in the queenless group developed to half-grown larvae in the six months I maintained the ants alive.

I dissected ten workers to determine how many Malpighian tubules were present. Of these, eight had five long tubules each, and two had four tubules. Evidently the counts of four represent specimens that lost a tubule during dissection, which is difficult because of the thick integument and the small size of the opening at the apex of the first gastric segment. At least some of the tubules are attached to the rectum.

The male of this species is characterized in the key to that sex below. In addition to the characters cited, the sides of the metanotum-propodeum and the dorsal surface of the scutellum are more heavily rugose than in the other two species keyed, and the body size is larger.

#### *Basiceros*—Revised Key to Workers and Queens

1. Posterior half or more of head disc-like, subcircular in outline, the margins forming a strong, continuous or nearly continuous raised crest ..... 2  
 Posterior half of head trapezoidal or subrectangular, not disc-like, the lateral borders of the vertex distinct from the posterior border, and not forming a continuous semicircular crest ..... 3
2. When head is viewed full-face, the arcuate crest or flange around the back of the vertex is medially emarginate and confluent at this point with the median convexity of the vertex (SE Brazil, subandean Colombia) ..... *discigera*  
 Arcuate crest around back of vertex continuous and entire, and separated from the median convexity of the vertex by a broad, uninterrupted sulcus that follows the crest (Trinidad) ..... *militaris*
3. Labrum a shield-shaped piece with rounded free margin, not divided medially, at least on its dorsal (extensor) face ..... 4  
 Labrum narrow, cuneiform, tapered apicad and with a distinct median division or groove ..... 5
4. Head narrow ( $CI < 75$ ) and nearly parallel-sided; clypeus and mandibles with abundant and conspicuous appressed squamiform hairs; petiole with 1-3 ventral processes, and usually at most 1 of these is well-developed and spiniform; base of first gastric sternite with a short but sharp, angulate longitudinal carina (Trinidad to N. Mato Grosso) ..... *singularis*

- Head wider (CI > 75) and more triangular; clypeus and mandibles with punctures, but no appressed hairs; petiole with 4-7 ventral processes, usually all or nearly all slender spiniform; base of first gastric sternite without a sharp longitudinal carina (Central America) ..... *manni*
5. Posterior dorsal half of head (vertex) continuously convex except for median sulcus; head wide, worker CI > 90; petiole and postpetiole with scanty pilosity, not hiding sculpture; 1 subpetiolar process (SE Brazil) ..... *convexiceps*
- Vertex with raised lateral margins and a median sulcate tumosity; CI < 90; petiole and postpetiole covered densely with fat squamiform hairs that conceal the surface beneath; 4-6 subpetiolar processes (W. Amazon Basin, Figs. 1, 2) ..... **conjugans**

### *Basiceros*—Key to Males of Three Species

1. Viewed full-face, head with a broad drawn-out neck longer than space occupied by ocellar triangle; mesokatepisternum opaque, covered by strong interlocking rugae; petiole about 3× as long as postpetiole (Trinidad to N. Mato Grosso) ..... *singularis*  
(*B. manni* from Central America would probably key out here, though the head and petiole may be somewhat shorter than in *B. singularis*.)
- Viewed full-face, head not produced behind, though with a flange along the cervical margin that is much shorter than the ocellar triangle; mesokatepisternum finely punctate, sometimes with upper part smooth and more or less shining; petiole about twice as long as postpetiole ..... 2
2. Anterior border of clypeus concave in the middle; more than half of mesanepisternum smooth, and even the punctate part strongly shining; upper middle part of mesokatepisternum smooth and shining (W. Amazon Basin) ..... **conjugans**
- Anterior border of clypeus entire; only the anterior half of anepisternum smooth and shining, remainder densely punctate and nearly opaque; mesokatepisternum densely punctate throughout, only weakly shining in upper middle part between punctures (SE Brazil, subandean Colombia) ..... *discigera*  
(*B. militaris* from Trinidad, possibly occurring also on the mainland, and *B. convexiceps* from SE Brazil probably key to couplet 2, but I have seen no male specimens.)

### Literature Cited

- BROWN, W. L., JR. AND KEMPF, W. W. 1960. A world revision of the ant tribe Basicerotini. *Studia Entomol.* (n.s.), **3**: 161-250.
- KUSNEZOV, N. 1962. El ala posterior de las hormigas. *Acta Zool. Lilloana*, **18**: 367-378.
- WEBER, N. A. 1950. New Trinidad Myrmicinae, with a note on *Basiceros* Schulz (Hymenoptera, Formicidae). *Amer. Mus. Novitates*, **1465**: 1-6.